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COTTAGE FARMING

M. DOYLE

COTTAGE FARMING

OR,

HOW TO CULTIVATE FROM TWO TO TWENTY ACRES.

WITH CHAPTERS ON

THE MANAGEMENT OF COWS, PIGS, AND POULTRY.

BY MARTIN DOYLE.

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LIST OF TOOLS AND IMPLEMENTS

REQUIRED FOR A

Cottage Farm Cultivated by Spade Labour.

Spades of different sorts and sizes
Shovel and Spud
Yellowley's Digging Fork
Hand Hoes of sizes
Dibber, Reel, and Line
Rakes, of sorts
Pitch Fork
Dung Fork
Three-pronged Field Fork, for collecting weeds, forking up potatoes, etc.
Pickaxe and Mattock
Sowing Basket
Baskets of sizes and sorts
Boiler
Sacks
Wheelbarrow
Hand Barrow
Ladder
Cask and Wheel-frame, for conveying liquid manure
Scythe
Reaping Hook
Shears
Bill Hook
Hand Saw
Hammer
Pincers
Flail
Winnowing Machine
Riddles and Sieves, of sorts
Chaff Cutter
Milk Pail
Coolers
American Churn, or
Common Churn
Tubs, of sorts
Crocks, of sorts

Where a Horse is employed, there will be required, in addition—

Plough, with moveable mould board
Harrow
Horse Hoe
Cart, with a moveable frame
Roller

COTTAGE FARMING.

CHAPTER I.

INTRODUCTION.

Cottage farming is field husbandry on a scale so small as not to require horse labour or costly machinery, and a cottage farm should therefore be tilled by spade labour.

A cottage farmer should possess sufficient capital: by capital, I mean money enough to buy everything that he may require in order to cultivate the land in the most profitable manner; he may also consider his live stock, the portion of his crops over what is necessary for the support of his family and the payment of rent and rates, and his labour, as capital.

A man who has not capital sufficient for his extent of ground, will not be able to buy cows, or pigs, or manure, on favourable opportunities, or to hold over his stock and crops when it would be disadvantageous to sell them. A prudent man, seeking land, should not take more than his means will allow him to cultivate in the best manner; for instance, if he have only money enough to buy cows or pigs, and everything necessary for ten acres, he will act foolishly if he take fifteen.

The best examples of cottage farming are to be seen in Belgium, and Belgian husbandry, which is mostly on a scale of from five to twenty acres, is worthy of imitation in the great care which is taken to collect manures and economise the use of them; in the perfect cleanliness of the crops, the judicious variety of the successions, and the great number of cattle kept in constant confinement on roots and green crops principally.

Before we enter into the management of cottage farms of any size, it will be necessary to understand some general subjects connected with husbandry, such as enclosing, draining, and manuring, we therefore proceed in our next chapter to consider the subject of enclosing a farm.

CHAPTER II.

ON ENCLOSING A FARM.

A COTTAGE farm, of whatever size, should in general be in one open field, without any internal fences. Fences, as boundaries even, between cottage farmers are wasteful, if the cultivators follow such a system as we are about to recommend. Besides waste of land, hedges in particular are injurious by encouraging the growth of weeds, by harbouring mischievous birds, and by shading crops when ripening; there are cases, however, in which a cottage farm may be beneficially divided into little fields by solid fences in bleak situations, where shelter is wanted, or where fuel is scarce and dear. In such cases, the loss of space caused by the fences may be more than made up by the shelter and fuel they afford. A cottage would look very ugly and uncomfortable without some pretty live hedge about its garden, if it were only to give shelter to bee-hives; but where cattle are either led out by a rope, or strictly confined to their houses, it is clear that no fences are wanted as security against trespassing.

Where enclosures are necessary, hedges of white-thorn are probably the best, if we consider beauty as well as durability; and by being cut down at due periods and plashed, they last for a very long time, and afford much protection against sharp blasts of wind. For mere durability and economy of space, in places where stones abound, stone walls are the best fences. Dry stone walls may be put together in a rough though regular manner by any expert labourer, and topped with grassy sods or large stones, so as to have a neat and compact appearance. The clearing of stones from the land, while it provides materials on the spot for the fence, makes more way for the spade into the ground, which may be cultivated up to the very walls: as they require no railing, and are perfect fences at once, they are very economical and serviceable.

Fences of furze (whin or gorse they are also called) are the most suitable on poor clay soils, or near the sea-coast, where blighting winds destroy white-thorn. Furze fences possess some merits which white-thorn and other live hedges have not; when they arrive at full growth, besides supplying faggots, they yield in their young shoots useful winter forage for milch cows and horses. Furze fences are usually made as follows:—A bank and ditch are formed, and furze seed is sown in two drills—along the top and back of the bank. It is common in Ireland to put a row of white-thorn quicks in the front of the furze bank, where the soil is sufficiently good and the exposure to severe wind not so great as to blight the white-thorn. The thorn quicks are laid horizontally, or nearly so, on a row of stones (with their roots imbedded in rich mould), which are laid to mark out the breast of the bank. When the bank is made from the soil raised from the ditch, the stems of the quicks are cut off nearly even with the breast, and the new shoots grow naturally upwards; the shelter which the bank behind affords them, until they rise above it, assists their growth, and the row of stones under the plants, keeps them more free from weeds and grass than they would be if laid on sods which would vegetate at the surface; the weeding is thus rendered more easy. Where fuel is valuable, this is a good sort of boundary fence, though the thorns may be somewhat impoverished by the close neighbourhood of the whins. In dry land it is as useless as it is wasteful, not to slope down the field side of the ditch, so that it may be cultivated; in wet land, however, the ditches are serviceable as drains, and should be treated as such by being cleaned out every summer, and always kept free for the escape of water.

In low land, liable to the overflowing of water, and drained by open ditches, hedges of Goldstone withies are useful, firm, and pleasing to the eye. To make a fence of withies (or willows), strong cuttings should be planted closely and evenly in a row, and at least twelve inches deep in the ground, with only an inch or two above the surface. By sticking them into the soft soil, in a slanting direction, they enter it more easily than if they were put down in an upright position. Their roots collect around them the particles of earth and sludge worn away from the sides of rivulets by the running stream, and therefore are protectors to the banks of dykes and rivulets in a double manner.

It is not good to plant timber quicks, such as ash and elm, among thorns. Hedge timber is quite unsuited to cottage farming, in which economy of land is so important. Hedge timber shades land too much generally; ash trees in particular are injurious to plants beneath and near them. The shade of trees injures corn, and prevents the natural thriving and ripening of plants; and their roots feed on, and impoverish a large breadth of land: they rob the thorns of their food, and these are injured by the drip of the leaves from the taller trees; besides, the roots of hedge trees attract a great deal of moisture, therefore, the headlands near them are often too dry, and the grass beneath them is always disliked by cattle. Thorn hedges, if kept low, cause no harm by shading; but for reasons already stated, they ought to be discouraged on cottage farms.

CHAPTER III.

LAND DRAINING: ITS EFFECTS AND IMPORTANCE.

By the draining of land, I mean freeing it from wetness, by drains made in a regular manner. The common causes of wetness in land are the lodgement of rain water on a clay soil, and springs bursting from their confinement in the undersoil to the surface, by reason of the closeness of the undersoil, which will not let them pass downwards. Where moisture falls on the ground, it can only sink if the earth be loose enough to let it trickle downwards: where it meets a substance such as clay, through which it cannot ooze, it collects, and there it increases in quantity continually, until it is forced in some spot towards the surface. It is thus that land-springs and quagmires also are formed. Tufts of rushes, or flags, will show that water is beneath; for, as we read in the book of Job, "Can the rush grow without mire? can the flag grow without water?" It is the bottom water, which nourishes them at their roots, and not the falling shower, which causes *them* to flourish. Where these aquatic plants grow, drains are required. When the wetness is caused, as is much more frequently the case, not partially by springs, but by the general lodgement of rain water on a clay soil, the land may be drained by any handy labourer without the aid of a professed drainer.

Thorough draining is the name given to the regular draining of land, at regular depths and distances, in clay soils more especially. To the late Mr. Smith, of Deanston, in Scotland, we are chiefly indebted for the general introduction of thorough draining; but Mr. Parkes has greatly improved Mr. Smith's system, and more clearly explained the philosophy of draining. Wet soils are colder than dry ones in spring and summer, because the vapours which then rise from the earth carry off heat from the soil; it is the stagnant water in the soil which feeds those vapours. It can be proved by the bodily sensations that the heat of the sun chills a moist surface, for if the hand be dipped in cold water, it becomes chilled by the action of the sun, in drawing the moisture from it. Surface moisture does not send down heat when it becomes heated by the sun, for its heat rises upward in vapour, being lighter than the air, just as the steam of water boiling in a pot rises upwards. In fact, moisture lodged in the soil, prevents heat from entering into it. Rain falling through warm air on porous land, carries heat into the free soil through which every drop passes easily, and thereby forces the growth of plants as if they were in a hot-bed. The evaporation of moisture in wet clayey soils, which is so injurious to plants, is prevented by thorough draining.

The depth recommended for general drains is from three to four feet; the outlet drains, to receive the water which runs from the others, must of course be deeper than those.* Shallower drains are less likely to intercept any underwater arising from land springs, and they do not afford sufficient depth of dry soil for the roots of such plants as grow deeply. The water which flows from shallow drains after heavy rains, carries with it sand, which is so precious in a clay soil, and manures also; and shallow drains do not cause such warmth in the undersoil as deep ones. Deep drains are found, in many cases, to carry off water falling on the surface sooner than shallow ones, as Mr. Parkes has proved by an experiment; and he has also shown that stagnant water under the upper clay surface, which it renders barren, can be drawn off by deep drains where shallow ones would have no effect. The following was Mr. Parkes' experiment; he was called upon to drain a field, in which drains three and a half feet had been already sunk, without effect, and it was supposed useless to make other drains deeper than two feet, to carry off the surface water. Supposing that there might be some free undersoil below the three and a half feet drains, Mr. Parkes sunk a hole through the putty-like clay, between four and five feet deep; moisture then began to ooze into the hole, which soon filled with water. Knowing by this that he had entered a porous vein of earth, he cut a drain of five feet, and over this he puddled in clay to within two feet six inches of the surface, and then laid another course of pipes in the same trench, so that he had a deep and shallow drain in the same cut, and the lower drain was so puddled over, that none of the top water could mix with that at the bottom. The lower drain discharged a gallon of water every minute during seventy-six days, and then the run came to a mere dribble, which showed that the under water had been nearly cleared out. At first the upper line of pipes drained off rain, but very soon afterwards all the water passed through the lower drain.

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* Where the undersoil is very close and deep, drains three feet will, in the opinion of the compiler, be more effective than deeper ones; in such case, the surface-water (we are not supposing any injury from *springs*) cannot make way downwards farther than worms may bore passages for it.

We learn from this experiment that a bed of gravel or other porous soil may lie under a pan of clay which holds the water, and does not let it pass below it, and that by cutting through the pan, vent may be given to water confined by it. Water four feet deep below the surface, can do injury to plants, as many penetrate four feet deep, and there is a power of suction by which water from an undersoil is drawn upwards. Shallow drains, sunk between deep ones, have been found quite dry, when these deep ones were running soon after rain, and perfectly clear too.

By thorough draining, the wet undersoil, being relieved from land springs or stagnant water, becomes dry and warm, because the chilling evaporation no longer continues: the rain which falls in the summer months becomes more heated by passing through a warm soil downwards to the roots of plants, and quickens their growth; whereas, as Mr. Parkes says, "If it were to rain warm water for a month on water-logged land, the temperature would not be raised one inch below the level on which the water rests."

Clay soil, when drained, is fit for being cultivated and sown at an earlier season than if it were undrained, and the harvest will be more certain: it requires less labour, less seed, and it produces from one-half to one-third more of valuable crops, than if it were left in a dropsical condition. And further, cold rains and fogs are much less frequent on drained than undrained land.

Thorough draining is very serviceable by rendering it unnecessary to have high crowned ridges, and by allowing instead a flat surface of equal depth, so that plants may grow and ripen evenly, which they cannot do on high arched ridges.

CHAPTER IV.

MANURES.

MANURES are substances applied to the soil, either to enrich it, or to remedy its natural defects. The manure in most common use for enriching land is that which is composed of the dung of animals, mixed with straw and other litter. Such manure is called putrescent, because it contains putrefying substances. It is also called farm-yard manure. All farm-yard manure is not equally good; its value in a great degree depends on the food and condition of the animals which produce it.

The dung of lean cows fed on straw is very poor compared with that of cattle fed on turnips, and on oil-cake more especially. The better the food and condition of the animal, the better the manure. Other enriching manures are used, but not so extensively; such as the blood and other refuse of a slaughter-house mixed with mould; crushed bones; and guano (which is chiefly the dung of sea-fowls); sea-weed also, which is of a fat and oily nature, is largely used by farmers living on the sea-coast.

The substances which remedy the defects of the soil without enriching it are called mineral manures, viz.: lime, chalk, limestone gravel, gypsum, marl, and sea-weed. Mineral manures loosen a stiff soil, improve its texture, and quicken its sluggish powers. Mineral manures, especially lime, enter into the substance of certain classes of plants. For instance, lime is found in the grains of wheat, yet it can hardly be said to nourish the growing wheat, any more than the particles of lime which a laying hen picks up can nourish her, though it is necessary to her in forming the egg shell. Barm is requisite to make dough ferment, yet though it assists in making good bread, it does not make it more nourishing. By lime, farmers mean limestone, or chalk burnt in a kiln; and quick-lime means burnt lime before it has lost its caustic or burning power by exposure to the air or moisture.

When quick-lime is applied to ground in a fallow state it should be first reduced to a powdery condition, by slaking it with water, and then scattered over the ground, which ought to be in a perfectly dry condition, else the lime will form lumps of mortar, instead of being blended with the soil. It should be lightly raked or harrowed into the surface. Dung should not be put on the ground for some weeks after the lime has been spread, because the lime would destroy the best qualities of the dung; and there are few cases in which it would be expedient to use lime and dung in the same season on the same land; but lime and dung may be used with great benefit to potatoes: half an allowance of each jointly would be better than a full allowance of either separately. Dung should be applied for potatoes to ground that has been recently limed, in the following manner. After the lime has entirely lost its burning qualities, drills should be opened thirty inches (or three feet apart if for a late crop), and the dung put into them, either under or over the potato-sets, and covered with the earth which had been displaced, in the usual way. Potatoes thus treated, ought in good land, and with a favourable season, to produce fifty measures (of ninety pounds) to the rood.

A clay soil requires the greatest quantity of lime, and a very sandy soil the least. Lime cannot be more economically applied than by mixing it with the grassy sods of headlands, and banks, and scourings of ditches, which reduces the vegetable matter in them to a state fit for nourishing plants. The effects of lime will continue for six or seven years.

Gypsum, or plaster of Paris, as it is also called, is the least valuable of mineral manures for crops in general; but for top-dressing plants of the clover tribe it is very useful, though it is doubtful whether it improves the soil.

The other class of manures in common use are what are called mixed manures, such as are partly vegetable, partly animal, and partly mineral; for instance, road scrapings, and peat or turf ashes. Peat or any other ashes containing much vegetable matter generally are good for turnips, potatoes, and for top-dressing clover; but without some lime or dung, they are not sufficient to nourish heavy crops of any kind. As burnt clay contains little or no vegetable matter, it cannot be supposed to yield nourishment for plants, yet it has been found highly serviceable, for wheat in particular; and a cottager, if short of other manure, ought to burn the undersoil of a headland, which occasions no loss whatever. Road scrapings, especially if taken from a road made of powdered limestone, are very good, as they contain mineral manures and the droppings of animals: it is often the cottager's chief reliance. The best way of using road scrapings is to mix them in a compost, or scatter them over clover or grasses of any kind.

Manure compost is a mixture of fermented litter from cow-houses, etc., with mould, sods, peat, or any animal or vegetable substances. Quick-lime should never be mixed with dung; but sea-sand or marl, which contain lime in a very mild form, may be mixed with dung and earthy matter. Quick-lime may be mixed with the surface sods of a peat bog, or any coarse vegetable and earthy matter, which it reduces by its caustic quality into fertilizing mould. It is rather a waste of labour to mix vegetable mould with dung in compost, because such mould is already in a highly fertilizing state; and it would be useless to mix it with quick-lime, as it has no substances which require to be dissolved by the action of lime.

The careful collection of manures should be especially attended to by the cottage farmer who has only a cow, or perhaps a pig or two to supply him with animal manure.

Composts of fermenting dung and earthy matter should not be turned oftener than is absolutely necessary to mix the ingredients of the heap together, and reduce the earthy substances to a state fit for use, because at each turning, some of the most valuable matter escapes, as may be perceived by the nose; but composts of mineral manures and earthy substances cannot be too often dug over and blended together. The cottage farmer should save every kind of animal manure in a pit, puddled with clay, and covered over head; into which every foul matter should be thrown; he should also have a cask sunk in the ground for receiving the liquids of the cow-house, that should be conveyed to it by a covered channel. He should have a little barrel fixed on a two-wheel frame, to convey the liquid manure from the cask to the field, where it may be wanted, and for filling it he will require a small moveable pump.

The liquid manure, after being weakened by water, if of too caustic a nature, should be emptied into small vessels convenient for the hand, and poured on the *roots* of transplanted cabbages, etc. (but never during sunshine), or else from a watering cart on a small scale (drawn by a man or horse), over clover or lucern, which it causes to grow with marvellous rapidity, especially if a top-dressing of gypsum have been previously given. It is by means of this liquid manure that so many crops are obtained in Belgium from very sandy soils. Crops in Belgium are manured more frequently, but perhaps less heavily than in England; for example, on a light grey loam, the following manurings are given by the Belgians in the course of eight years:—

YEAR.
1. Rape, with liquid manure and rape cake dissolved in it.

2. Wheat or rye, with dung.
3. Rye and clover.
4. Clover, with ashes.
5. Wheat, with liquid manure.
6. Turnips, with dung and liquid.
7. Oats.
8. Flax, with abundant manure.

For wheat or rye, two and a half tons of dung or compost are applied to a rood; for potatoes and beans five tons, and for turnips about one and a half tons.

In a word, the cottage farmer should save from waste anything and everything, that will serve for manure; he should make some sort of shed over his dung pit, to prevent rain water from falling on it, and take care that no manuring liquid shall be washed away from the yard.

CHAPTER V.

THE MANAGEMENT OF A TWO-ACRE FARM.

THERE are no fixed rules by which small farms should be cultivated, because different circumstances may render different methods equally good. A cottage farmer living near a town, may find that potatoes and garden vegetables are the most profitable productions in his case; but if he can make more money by keeping cows and pigs, he should grow vetches, clover, cattle beet,* parsnips, etc., for them, as largely as possible. A cottage farmer with two acres would be very extravagant to keep his small piece of land under pasture, unless it were low ground, liable to be overflowed by water. One acre of tillage will yield as much food for a cow as three in pasture.

The varieties of soil and climate, and the greater or lesser value of certain crops, are reasons why fixed rules cannot be laid down for the culture of land. There are rules for the guidance of every cultivator, viz.: to dig deeply, manure plentifully, keep the ground loose and clean, and avoid taking the same sorts of crops immediately after each other. He should also try to obtain many and quick successions. From two acres, a cottage farmer might obtain food (except hay for winter fodder) for two milch cows, two or three pigs, with some corn, potatoes, and all garden vegetables for the use of his family. To economise two acres, so as to make them yield milk, pork or bacon, corn, potatoes, and other vegetables, I would divide them by simple furrows into six portions, to be cropped as follows, after the manner of Mr. Tower's plan of management for 100 acres. The chief excellence of Mr. Tower's plan of cropping is the variety of the ameliorating crops, to all of which a dry rich loam is suitable; and the frequency of corn crops (if they were profitable), in the rotations.

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* Cattle beet is more easily pronounced than the German name of the same plant—Mangold Wurzel.

The successions and proportions stated in this table of crops may be advantageously changed in some of the details, according to the quality and condition of land and other circumstances, and yet without departing from the general arrangement, by which the most suitable classes of crops follow each other with benefit to each other and to the soil. Soil, though not too clayey for wheat, may be unfit for barley; on such soils, wheat, rye, or oats should be brought into the rotations in its stead; carrots should be left out, and beans, drum head or Scotch cabbages, put in their place: rape, also, would be better on such soil than any sort of turnip, or cattle beet. But it is to be remembered that thorough draining and careful tillage will make a clayey soil fit for barley and the other crops which are unsuited to it in its natural state. On a very sandy soil, rye and oats

ROTATION OF CROPS ON A TWO-ACRE FARM.

First Year.	*Second Year.*	*Third Year.*	*Fourth Year.*	*Fifth Year.*	*Sixth Year.*	*Seventh Year.*
Perches.	*Perches.*	*Perches.*	*Perches.*	*Perches.*	*Perches.*	Same as first year.
90 Wheat	30 Turnips and Cabbages. 15 Cattle beet and Carrots.	45 Barley or Oats.	45 Clover.	45 Wheat.	30 Potatoes. 9 Vetches. 6 Beans.	
	30 Potatoes. 9 Vetches. 6 Beans.	45 Wheat.	30 Turnips and Cabbages 15 Cattle beet and Carrots.	45 Barley or Oats.	45 Clover.	
45 Clover.	45 Wheat.	30 Potatoes. 9 Vetches. 6 Beans.	90 Wheat.	30 Turnips and Cabbages. 15 Cattle beet or Carrots.	45 Barley or Oats.	
30 Turnips and Cabbages. 15 Cattle beet and Carrots.	45 Barley or Oats.	45 Clover.		30 Potatoes 9 Vetches. 6 Beans.	45 Wheat.	
45 Barley or Oats.	45 Clover.	45 Wheat.	30 Potatoes. 9 Vetches. 6 Beans.	45 Wheat.	30 Turnips and Cabbages. 15 Cattle beet and Carrots.	
30 Potatoes. 9 Vetches. 6 Beans.	45 Wheat.	30 Turnips and Cabbages. 15 Cattle beet and Carrots	45 Barley or Oats.	45 Clover.	45 Wheat.	
270	270	270	270	270	270	

40 perches of Lucern, 10 perches of Garden—Total 320 perches.

should come instead of wheat and barley, and peas and carrots should be in place of beans; and so in other details, changes should be made according to the quality of the soil.

Intercalary crops* might be introduced between those that have been above recommended; for example, in the first year, first column, stubble turnips, rape, or *Trifolium incarnatum* might be sown immediately after the removal of the wheat, except on a part intended for winter vetches. Cabbage plants (with liquid manuring) might be put down between drills of early potatoes, when nearly ripe, and moulded after the potatoes are removed; these cabbages would be consumed before the season for wheat sowing. In the same column, rape plants might be introduced among the beans; rape seed might be sown after the last hoeing of the beans, and the plants would afford some green food in the autumn before wheat sowing. Thus every year additional crops could be obtained, also, by dropping beans thinly in potato drills some additional produce may be gained without injury to the potato crop.

Trifolium incarnatum, mentioned above, is a variety of the clover family: it bears a beautiful crimson blossom, and yields *one* good cutting. By sowing it in autumn, it is fit for cutting in the next year in time for a crop of turnips, or for transplanted field beet, or swedes, cabbages, etc. Afterwards it is valuable for filling up any bare spaces that may appear in autumn in the spring-sown clover.

Stubble ground should be lightly dug or forked for rape, or other crops, the stubble and weeds raked off and burnt, or carried to the cow-house or pigstye: the seed should be sown broadcast.

There remain fifty perches to be apportioned; of these I would have forty perches under lucern, if the soil were suited to it, and ten perches for a garden.

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* Intercalary means anything that may be brought in between other things, out of regular order.

Lucern is a long-lived plant of the clover family, but far more nourishing and productive, on soil suited to it: it will flourish for ten or twelve years, if properly treated. The best soil for lucern is a very deep, calcareous loam, resting on an undersoil of limestone gravel or free chalk. The roots penetrate to a great depth, if they are not stopped by a hard substance, such as clay. The quality of the undersoil is highly important, for the roots of this plant soon perish when they reach a wet clayey bottom; they require a free and sound undersoil. Two or three feet depth of good surface soil is necessary for the perfection of lucern, but a lesser depth of it with a good deep undersoil will suffice. Ground should be trenched deeply with a spade for it. If a ley field be broken up for it, the turf should be laid at the bottom of the trench. Couch, and indeed all weeds should be carefully collected and burnt, and manure should be mixed with the soil for the support of the growing plants, until it becomes necessary to give them top dressings. The beginning of April is the time for sowing lucern seed; it may be sown in drills twelve or fourteen inches apart, or broadcast, if care be taken not to crowd the plants. It may be sown with barley, as clover is, provided the barley be not thickly sown; or it may be sown more safely with flax seed. Unless the flax crop be drawn out of the ground very violently, and with great carelessness, no injury will be done to the young plants of lucern. Lucern will be fit for cutting very early in the year after that in which it has been sown. Two cuttings may be expected in the second year, fully equal in bulk to the produce of a good clover crop throughout any entire season. In the third year it will yield three cuttings, and afterwards four, or perhaps five in the year, if always mown before the blossoms fully appear. A rood of prime lucern would probably support a moderately-sized cow from the middle or end of April to the first of November, without other food. The addition of some field beet leaves along with the lucern, towards autumn, would insure her, however, against any stint of food. Every perch of it may be mown once in every five or six weeks, for six months, as its growth is much more rapid than that of clover; in short, on land perfectly suited to it, no crop, for soiling, equals it, except sainfoin, which is very like it in many particulars, and is much cultivated on the chalk soils of England. Lucern should be kept as free as possible from grasses and weeds at all times, and every spring, after the second year, it should be harrowed or raked very deeply: this will make the plants grow vigorously. A top dressing of compost manure, or of vegetable ashes, soot, or any other enriching matter, should be applied every second year, immediately after a mowing; and a dressing of lime, chalk, or gypsum should be given in the other years. A plentiful sprinkling of liquid manure after a mowing of the lucern is much to be recommended. Nothing causes more quick vegetation of the whole clover tribe than the ammonia which the liquid manure of cows and horses affords. Lucern, which is a native of warm and dry climates, does not suffer from drought; its very long roots always find sufficient moisture in the depths of the soil; yet showers which refresh other plants promote the growth of lucern also. It is fit to be cut at least a fortnight earlier than clover.

The most economical manner of using lucern is to give it green, as soiling, to all kinds of live stock. Milch cows thrive well on it, but as it is apt to fill greedy cattle with wind, if they eat it in too juicy a state, it should be cut a few hours, and exposed to sunshine, before it is given to them. Lucern hay is capital food for horses or cows, but it is very uneconomical not to keep a cow or two to eat lucern in its green state. No beast should ever be allowed to graze on lucern; though the mouth of the cow will do no injury to the plants, her hoofs may, and the close grazing of sheep would destroy the crowns of the plants.

If the land be not suited to lucern, I would add six perches and two-thirds to each of the six portions of ground allotted in the table, so that the regular successions, as laid down there, might be duly observed. Lucern should not take its regular yearly turn with other crops from one division of land to another. Since lucern lives and grows during many years and does not arrive at full vigour in a season or two, it would be wasteful to root it out while it continues growing and productive.

CHAPTER VI.

THE MANAGEMENT OF A TWO-ACRE FARM—CONTINUED.

SUPPOSE a cottage farmer to get possession of two acres of grass or old ley land at Michaelmas, he can bring it under cropping, on Mr. Tower's plan, in the shortest time as follows:—Let him first dig forty-five perches very deeply, turning the grassy sides of the sods down, and laying them as evenly and closely as blocks of stone or wood are placed for pavement. On this portion, winter and spring vetches may be sown in drills, formed with a hoe, twelve inches apart, and raked in. Thus green food for cow-feeding in the next summer will be provided. Then let him dig forty-five perches in the same manner,* for wheat; forty-five more at leisure, in the course of the winter for spring oats (if the wire-worm do not infest the ground), with which clover may be sown; ninety perches in the same way, either for winter or spring beans, as time may allow—and trench all the remainder during the winter, for potatoes, cattle beet, Swedish turnips, garden roots, and lucern if the soil suits it. So large a portion is to be laid apart for beans as they are a good preparatory crop for wheat; they are profitable also, and raised with little labour, and this quantity of the land will exactly suit for the proportion of wheat to be sown every year according to the table. Manure will be necessary for the beans, or ley, unless the soil be very rich. Short dung or compost manure should in such case be spread on the surface before digging.

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* In ground in which grasses have rooted deeply, it will be better to turn over the upper sod more lightly, and to cast a second spit over it in order to smother the grasses effectually.

Beans should be planted with a dibble, in rows sixteen inches apart, with eight inches between the holes (two and a half inches deep) in each row, and about three beans should be dropped in each hole, after which a rake should be passed, or a bush drawn over the rows to cover the seed. Winter beans usually ripen a fortnight earlier than spring beans, and the produce is generally greater. When stubble turnips are to follow, this early ripening is important. The quality of spring beans is usually better than that of winter beans, and the time for sowing them (February), interferes very little with other field labour, whereas the planting of winter beans may interfere much with wheat sowing.

The crop of beans should be well hoed twice, so that the land shall be kept clean for the next crop. A cottage farmer will find a ready sale for beans, and he may reserve some for his pigs, before and after they are weaned.

The cottage farmer should sow his wheat with a dibber. Though holes for wheat are usually made in rows eight or nine inches apart, and six inches apart in the rows, we would recommend that in strong and fertile soil, the holes should be ten inches in every direction, in order to admit of perfect hand-hoeing, and free circulation of air. The number of grains put into a hole will depend on the season of the year, and the distances of the plants from each other. Three or four grains, if dibbled before the middle of October, will be sufficient for each hole. The number of grains after that period should be about five or seven, according as the season advances. The holes need not be deeper than one, or one and a half inch for wheat, or for any sort of corn. The cottage farmer may expect to have ten bushels of wheat on a rood of very productive soil. Though the ground may appear rather bare when the plants of wheat are ten inches apart, these having so much room for their growth, become more vigorous, have larger and fuller ears, and are less likely to fall in wet seasons than if the stems were closer; and therefore ten or even more bushels of wheat may be produced on a rood by such wide dibbling.*

The cottage farmer should dibble barley and oats, but as these do not tiller or stock nearly so much as wheat, they do not require greater space than seven inches between the rows, and six inches between the plants in the row, and this space is sufficient for a narrow hoe to pass between the plants. Six or seven grains of barley, and eight or ten grains of oats are enough for each hole. A rood of well-tilled and fertile soil will produce about twelve bushels of barley, and sixteen or seventeen bushels of oats.

Dibbling in any case causes a saving of seed, and clover may be sown after one hoeing of the spring weeds, and this hoeing is a benefit gained. The most ready manner of marking out rows for dibbling is to take two lines, and to stump down an end of each at the proper distance of the rows from each other, and then go to the other end of the ground, and stump the lines there also, thus: A, B, C, D, are the four stumps with the lines stretched

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* We have seen wheat dibbled at sixteen inches every way with good effect: and it is believed by some who have had long experience, that when the seed is dibbled at this distance the produce is greatest.

A..B
C..D
E..F
G

The workman begins at A and dibbles to B, he then shifts the stump B to F, and goes on dibbling from D to C; he then shifts the stump A to E, which brings the line straight from F to E, he also removes the stump C, and sets it at G.*

The chief advantages of dibbling beans and corn are the saving of seed, the regularity of the growing plants, and the facility afforded for hoeing the surface, which keeps it free from weeds. Seven women or boys will dibble an acre of corn in a day; even so closely as eight or nine inches between the rows, and six inches between the holes in the rows; when the distances are increased, the time and labour are, of course, lessened. It would be more easy to bring stubble or fallow land into immediate cropping, according to the plan laid down, than ley land, inasmuch as the labour of digging and preparing it would be less.

A man, without overworking himself, could roughly but very deeply dig fourteen inches deep from eight to ten perches of stubble land in a winter's day, and for many successive days; and if the winter's digging be well done, the spring digging will be more quickly executed.

All the spring crops will not require to be put into the ground at the same time; for instance, if the setting of cabbages and beans, and early potatoes be commenced in February, the digging or forking of the soil for them may be easily done after the previous deep digging; there will then be some weeks for digging the divisions intended for spring corn; after this is over-ground, drills may be opened and completed for cattle beet. If lime, or compost of lime and earth, had been scattered over the surface intended for the main crop of potatoes, it will be only necessary at the planting season to dig at first narrow strips, thirty to thirty-six inches apart, into which the sets might be dibbled, without at that time digging the spaces between the rows. Or drills, barely wide enough for receiving a due allowance of dung, might be planted and covered, and the spaces between them, as in the other case, dug in the course of a month or six weeks afterwards, when the potato plants have clearly appeared; thus time would be economised without any injury to the first or succeeding crop. The preparation for turnip land would not be necessary until all other work was over.

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* "Agricultural Gazette."

A spade is the best implement for digging loam or any crumbling soil, but a fork is better for digging clay, because it enters the ground more easily, and turns it over equally well. Dr. Yellowley's three-tined fork is probably the best for digging stiff land. The fork part is 13½ inches in length, and weighs 10 lbs.; the whole length is 3 feet 3½ inches, and the wooden handle is 2 feet 2 inches. A workman will dig more clay land with it in a day than with a spade, and also with less fatigue.

CHAPTER VII.

ON COW KEEPING.

As soon, in the spring, as the cottage farmer has vetches, clover, or *Trifolium incarnatum* fit for cutting, he should provide himself with a milch cow to eat those crops while green, and thus supply almost all the manure he will require. The cow should be confined to her stall, except when led out to drink and move her limbs; unless her owner have a right to graze her on some free land, in which case, no doubt, she will derive some benefit from the enjoyment of liberty throughout some hours of the day; but the cottage farmer should not turn out his cow on his own field. The leaves of cattle beet will supply the cow with food in the months of October and November. Cattle beet or carrots, and some soft sweet hay, with grains and pollard, or bean meal, potatoes, or Swedish turnips boiled and mixed together in a tub, with about half an ounce of salt at each meal, should be the cow's winter food. Turnips* of any kind are apt to give a disagreeable taste to milk and butter, and therefore are not to be recommended as food for a cow whose milk and butter are intended for the market.

Raw field beet does not give any disagreeable taste to milk and butter, and it certainly adds richness to the milk. Some people scrape off the rind of the field beet, lest any of its flavour should be communicated to the milk and butter; salt should always be given with it. With suitable soil, and plenty of manure for it, the cow-keeper should decidedly prefer field beet to turnips: on indifferent soil, turnips however yield much greater weight. A rood of field beet, not transplanted but sown, and well-managed in every respect, out to produce four or five tons' weight, besides sixty or seventy bushel baskets of beet leaves, calculating the rows to be two feet apart, and the plants eighteen inches from each other in the rows.

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* A little nitre put into the pail into which the milk is to be drawn, or into the churn with the cream, will, in a great measure, dissipate the unpleasant flavour given to milk and butter by raw turnips, cabbages, and potatoes.

Three stones (of 14 lbs.) of cattle beet will give three sufficient feeds per day to a cow, giving milk; when dry, she should not get any roots, lest she should become fat; hay alone will then sustain her body in good condition for the secretion of milk; grains, bran, and mashes of all kinds, are only fit for a cow while giving milk. If a rood produces, as we have calculated, four or five tons' weight of cattle beet, and the cow consumes, on an average, 42 lbs. per day, it would maintain a cow, with hay, of course, during from 213 to 270 days: a rood would be sufficient for two cows during half the year, with other roots occasionally given for a change of diet, which is a very necessary thing to be attended to: Cows, like human creatures, relish a change of diet, and milch cows require it. The leaves of field beet are very good for cows, if given to them quite green and fresh. Until the plants have entirely ceased growing, no leaves should be stripped off, except as they begin to droop. Their drooping is a sure sign that they are no longer serviceable to the plant, and may be removed from it.

The culture of field beet is as simple as that of Swedish turnips, and may be considered as exactly the same. After the land has been thoroughly worked, open drills, 26 inches apart; fill them with short dung, and cover it; roll, or with the spade level the ridges; make holes, not more than an inch deep, 12 inches apart; drop three or four seeds into them, and cover them with the finger. When the plants are the size of a man's little finger, the supernumerary ones should be drawn out so carefully as not to injure the roots of the remaining plants. Weeding and hoeing should be attended to for the remainder of the season. Half a pound of seed is enough for a rood: in dry weather the soaking of the seed for twenty hours, in tepid water will quicken its germination. The soundness of the seed, too, will be tested by this process.

Food should be given to a cow in moderate quantities at a time, so that she may have leisure to chew the cud, digest her food, and eat again with appetite. A cow will sometimes go dry three or four months before calving, but she should be sold off as unprofitable.

A person who has but one cow, will act imprudently in rearing her calf, unless it be of a very valuable breed, or he can spare the milk which it will require. If he rears a calf it should be one worth rearing. If the calf be reared, it should be removed altogether from its mother, after it has sucked the disturbed milk, which acts as a wholesome medicine to the calf, while it also relieves the mother; it should get about two quarts of *new* milk each day during the first week, four quarts the second, eight quarts the third. Afterwards three pints of oatmeal gruel, should be put into hot skim-milk, to make it milk-warm; any sort of milk, may be given the fifth week, and if a little linseed or oil-cake be added, the increased vigour of the calf will repay the expense. An ill-fed calf will never make a fine beast, however well fed it may be when grown up. After five or six weeks, water may be mixed with milk and the porridge left off gradually, and at fourteen weeks the calf will be weaned, and able to feed on bran, tender grass, etc. A handful of fresh hay or grass hung up by a string a little higher than the calf's head, is perhaps one of the quickest methods of teaching it to eat. A calf should not be allowed to suck its mother, as it is difficult to wean a calf which has often done so, and a cow feels so restless when her calf is taken from her, that it becomes difficult to milk her by hand; besides, a calf may suck more than enough when allowed to help itself without measure. By giving the above quantities, a calf of average size gets milk enough for its nourishment, and sufficient is left for family use.

A good cow ought to give at least 16 pints of milk a day on an average, during eleven months, that is 5392 pints and 250 lbs. of butter in a year. A cow gives most milk during the first three months after calving; and the period of the year when milk flows most freely is in the first three summer months, from the joint effects of weather and fresh green food.

It depends upon circumstances, whether a large quantity of poor milk or a moderate quantity of rich milk be more beneficial to a cottage farmer. If he lives near a town, and sells new milk, the greater the quantity of milk the better for him; but if butter-making be his object, and he only wants skim-milk or butter-milk, the richer the milk the more beneficial for him, though the quantity may be small.

A cow confined to a stall should be curried and wiped down, or brushed every day, so that her hide shall be kept perfectly clean. Her food should be given to her warm in winter. Her manger should be frequently washed, her stall kept sweet and clean, and in summer, if flies and gnats be disposed to torment her, she should be shaded from sunshine, and then insects will cease to sting her.

There are so many good breeds, such as the Durham, Ayrshire, Hereford, Lancashire, Devon, Suffolk, and Jersey or Alderney, that it is not easy to pronounce which is most suitable to the cottage farmer. Many counties have their favourite breeds of cattle, and the purchaser must be content with what the neighbourhood supplies. We should, however, prefer a cow of the Durham sort (supposing plenty of food to be obtainable for her) as an animal which has superior dairy qualities, is gentle in temper, bears confinement well, arrives very soon at maturity, and fattens quickly and to a great weight. The Ayrshire is excellent for the pail and the butcher, but is apt to become fat while giving milk. The English above-named are all excellent: the Devons are remarkable for the richness of their milk, but the quantity is not considerable. The Jersey are good for the pail, but not for the butcher. There is a small breed brought from Brittany (where they are bought very cheaply) and sold in England as Jersey cows, which are suited to a cottager who has but a limited supply of cattle food.

The milk of a cow, both as to quality and quantity, will principally depend on the sort of feeding she has. However, from the points of form in a cow, a judge of cattle will know whether a cow will be a good milker or not; and he will look to her shape, as well as her ancestry, if he be a sensible and practical man. The points most desirable in a milch cow I can tell in Dr. Anderson's verses better than in my own prose:—

> " She's long in her face, she's fine in her horn,
> She'll quickly get fat without cake or corn;
> She's clear in her jaws, she's full in her chin,
> She's heavy in flank, and wide in her loin;
> She's broad in her ribs, and long in her rump,
> A straight and flat back with never a hump;
> She's wide in her hips and calm in her eyes,
> She's firm in her shoulders and thin in her thighs;
> She's light in her neck and small in her tail,
> She's wide in her breast and good at the pail;
> She's fine in her bone and silky in skin,
> She's a grazier's without, and a butcher's within."

If a cow has all these good points, it matters not where or by whom she was reared, or of what race she is called;—if she is thus good and beautiful, nothing more need be inquired about her; still as 'like produces like,' it is safest to purchase one whose ancestry has been known to possess superior constitutions and milking properties.

CHAPTER VIII.

THE DAIRY.

A NORTH aspect is best for the dairy, because it is important to have it cool in summer. It is better not to have any door of communication between the dairy and the dwelling-house, lest impure air should thereby enter into the dairy. Flags make the best flooring for a dairy, as they are cooler than boards or bricks, and therefore good for the milk pans to rest upon in summer.

The utensils required are a skimmer and churn, and pails, coolers, and crocks, according to the number of cows. Many persons use a hair sieve for straining milk, but as it is not easily kept clean, and is apt to become so *furry* that the milk passes through it with difficulty, it is better to use for straining a piece of coarse canvas, which is easily rinsed clean. Coolers made of zinc are the best; but tin ones, which are cheaper, are well-suited to the cottage farmer. Earthenware coolers, though very cheap at first, are dear in the end, because, even though they may escape breakage, they become unserviceable in the course of a year, as the glazing inside, which is necessary in order to prevent the milk and cream from sticking to the vessel, becomes rubbed off by the process of cleaning, however carefully it may be done. The circular form is the most convenient for coolers, with a diameter of from twenty-four to thirty inches, and a depth of about seven inches. In shallow coolers, a greater surface of milk is exposed than in deep ones, therefore, the milk drawn warm from the cow and poured into them cools more quickly (and this is desirable in mild or warm weather) than if it were put into deeper ones. In very cold weather the escape of warmth may be prevented, in a great measure, by placing a wooden lid over the cooler, of which the rim should be made so perfectly level that the board shall rest closely on it. Wooden coolers are commonly used, but they are not so good as metal ones, because they require a great deal of scouring and exposure to the sun or wind to keep them clean and sweet, whereas a slight rub from a towel frees the metal coolers from taint or smell, especially if bran or soda be mixed with the hot water, with which they should be cleaned. Every utensil belonging to the dairy should be kept perfectly clean, and the woman who attends to it should be herself very cleanly in her dress and person; and she should sponge the udder and teats of cows, if they are in the least dirty, for milk is very easily tainted, and unless cleanliness in the management of it be strictly maintained, good cream and butter cannot be had.

Cows should be milked at regular hours in the morning and evening, to allow twelve hours for the due secretion of milk in the udder. Some few cows require, when in full milk, to be milked three times a day, the necessity for which is shown by the dropping of the milk from the distended udder; but such cows, though excellent for the dairyman who sells new milk, are not good for the purpose of butter-making, because such milk is not rich. Great gentleness in handling the cow should be observed. A passionate person may render a cow (especially a young one) troublesome and even vicious, whereas, a soothing manner will effect what rough handling and a scolding voice cannot. Great care should be taken to milk the cow quite dry, because the last portion of milk drawn is the richest. The usual practice is, after the cows are milked nearly dry, to draw off the remaining milk, about half a pint in quantity (which is called drippings or strippings), into a separate vessel. This rich milk is either put by in a small cooler, to supply the best cream for the tea table, or mixed with the other cream for churning.

It is dangerous to milk a large quantity at once from a cow that has just calved. A small quantity at a time should be drawn till the milk vessels of the cow have recovered their contracting power.

In the ordinary temperature of the air, the cream should be skimmed off in twelve hours, but in very cold weather, it frequently will not rise in less than twenty-four hours at the soonest, unless the dairy be artificially warmed by a pan of charcoal or a clear wood fire, from which no smoke should be allowed to issue. If cream be ripe, that is, fit for skimming, it will stick to the finger, when dipped into it, like paste,—or if the blade of a knife be put into the cream, and no milk rises into the slit when the knife is drawn out, the cream is ripe. The most economical use of skim-milk is to give it to pigs. In many parts of the country, skim-milk is not worth more than a halfpenny a quart, and if given to a pig, it would produce more than a pennyworth of pork or bacon.

The best butter is that which is made from fresh cream, but generally, it is necessary to wait for some days, until cream enough is collected for churning. In very cold weather, it is useful to pour boiling water into the churn; when the water is poured out, the heat of the churn will impart warmth to the cream.

The American churn is decidedly the best kind of churn; though more expensive than other churns, it does its work in a very few minutes, and so well, that it will soon pay for its extra cost. The butter, when taken from the churn, should be put into pure, cold spring water, and sprinkled slightly with fine salt, in order to clear it from every drop of milk; it should then be kneaded well with clean hands, and lastly formed into rolls or pounds, if it is to be disposed of in a fresh state. If it is kept over, it should be packed in a crock or firkin, with a sufficiency of salt scattered through it, and a heavy sprinkling on the top.

Cheese making generally is hardly within the cottage farmer's province; however, *potato cheese* is made in France, as follows:—Take 4 lbs. of mealy potatoes and reduce them, when boiled, to a fine pulp. Add 2 lbs. of sour milk and some salt; knead the mixture together, then cover it. At the end of three or four days knead it again, then hang it up to drain, and when sufficiently drained, put it into a mould and place it in the shade for a fortnight to dry; afterwards put it into a close vessel in a dry place. It will improve with age.

CHAPTER IX.

ON PIG-KEEPING.

COTTAGERS who are in the habit of keeping pigs buy one or more at the age of fourteen or twenty weeks. Where a cow is kept, the rinsings of the churn and milk vessels, the washings of pots and dishes, and whatever sour milk can be spared for them, will, with clover, lucern, boiled turnips, cabbages, field beet, and any offal from the field or garden, keep these pigs in growing condition until towards the close of the year, when bran, pollard, and at last barley-meal should be given to them, with potatoes or other boiled roots. Those who start with two pigs in summer should kill one of them at Christmas and the other in March following. With two acres and a cow, a man might most advantageously keep a breeding sow. Let him buy, in summer, a sow eight or nine months old, and gone with young. By feeding her well, her growth and condition will be improving, and afterwards, while suckling seven or eight young pigs (a fair average number of a litter) for three or four weeks, until they are fit for sale as roasting pigs, she will not become thin, and she will become thoroughly fat for bacon by the end of the year. This is the most economical of all methods of pig-keeping.

The profit of pig-keeping mainly depends on having some sort of milk, which remarkably assists the growth of pigs. A cottage farmer who lives near a brewery or distillery, where he can procure grains or wash, can also keep pigs with great profit, if he have a garden.

Pigs should have dry and clean litter on a floor some inches higher than their yard; their troughs should also be clean, and no rain should be allowed to penetrate to their beds. Boards, if not closely laid over a hollow space into which the urine of the pigs will drop, and from which it can be conducted to the dung pit or cistern, form the warmest flooring, and keep the litter in a dry state, which is important if litter be scarce. The skins of the pigs should be frequently curried or scrubbed with a wet brush and soap suds; this gives them great satisfaction, and tends to their health. A scurfy skin is a sure sign of an unthriving condition; but pigs kept clean, well-fed, getting some milk, and frequently washed, have always a ruddy skin, which shows their healthy state.

A brood sow has sometimes proved as profitable as a little cow,—but milk is all-important to family comfort, and the keeping of pigs should not be thought of in preference to cow-keeping. A sow, however, that farrows a litter of ten or twelve youngsters twice a year, and rears them until they are sold for 12s. each, is a valuable animal; and considering that she can be bought for much less than a cow, and be so much more cheaply fed, greater proportional profit will be obtained by her than from an ordinary cow.

The Berkshire and Hampshire swine are so thrifty, so easily fattened, and so handsome, that they are among the best sorts. The Cumberland and Suffolk breeds are also excellent.

When a sow is going to farrow, care should be taken that her allowance of litter be small, and that the straws be cut into short pieces, lest the young pigs should be smothered in their bed. The best and cheapest feeding for a sow, before farrowing, is an abundance of boiled Swedish turnips, mixed with a little bran, and wash from the kitchen. Immediately after farrowing, she should get some warm oatmeal or barley-meal gruel, with a quart of beer in it; afterwards, turnips, refuse potatoes, parsnips, or beet, boiled, with pollard, and the rinsings of milk vessels, etc., will be an excellent dietary for her. At the age of three weeks or a little sooner, the young ones will eat grains of barley, which should be given to them two or three times a day; a few beans also, should be thrown to them: these will stimulate their growth very much, and may be given, if without barley, at the rate of half a pint a day for each pig, with boiled roots, etc. They should be weaned when eight or ten weeks old, and for a short time nourished with beans in small quantities.

Potatoes, with barley-meal, or peas-meal, is the best meal for fattening bacon pigs: beans, though they fatten, make the fat too *hard;* and bacon merchants say that the fat of potato-fed bacon or pork is firmer and *takes the salt* better than the meat of either meal or bean-fed pigs. A vessel of pure water should be kept in the pig-stye when pigs are feeding on this kind of food. The most approved weight for a bacon pig is from one and a half to two hundredweight.

CHAPTER X.

ON BEES AND POULTRY.

THERE is no expense in keeping bees, except a few pounds of coarse sugar and sweet wort, to make syrup for them occasionally in winter. They provide themselves with food from the blossoms of all the plants within their reach. The early blossoms of the gooseberry and currant, and the earliest flowers of the garden, and then those successively of clover, potatoes, beans, and the wild ones which they find in woods and commons, supply them with their choicest food. They live by their own exertions, and it is not the rarest and most beautiful flowers which afford the best honey, but those which abound in the open field as well as in the garden. For full directions on bee-keeping we recommend Taylor's "Bee-keeper's Manual," the most complete book on the subject.*

The cottage farmer with two acres ought to keep poultry, especially ducks, which occasion no trouble, and do no mischief: they do not scratch up seeds and growing plants; ducks do not require regular feeding; they may be allowed to waddle through any cropped field, where they employ themselves usefully in gobbling up snails, slugs, and other delicacies of the kind, which are better out of the farmer's way. Thus they principally feed themselves, and as they lay many eggs in the spring, and rear their young with very little assistance, six ducks and a drake may be profiably kept by a cottage farmer who has a field and a pond, or a stream of water in which they may dabble, as they must have water, except when they are being fattened for the spit: they require but little oats or meal. As the cottage farmer with only two acres might as well think of maintaining an elephant as a flock of turkeys; and as geese are out of the question, without a privilege of grazing them, and the convenience of water, beyond ducks, the cottage farmer with only two acres should content himself with keeping common fowls.

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* THE BEE-KEEPER'S MANUAL. By HENRY TAYLOR. Price 4s. Groombridge and Sons, London.

The cheapest modes by which a stock of fowls can be raised is by procuring a hen, suppose of the Dorking or any other approved breed, that will both lay and sit diligently. If a hen be obtained that sits in the summer, her owner will soon have a sufficient stock creeping up. It is not desirable that the cottage-farmer should keep varieties of fowls; though persons who have lodges, and court-yards, and paddocks, can gratify their taste for variety without inconvenience, the cottage farmer should be content with one pure kind of fowls, such, however, as the great city poultry-dealers seek for principally.

For restraining any poultry from doing mischief, and yet allowing them sufficient space for air and exercise, part of the field or garden nearest to the house might be fenced off as a poultry-yard. The most simple and secure fence for a poultry-yard is "One of slabs set on end, six or seven feet high, or any thinnings of fir or other trees, split and put close together, fastened by a rail at the top and another near the bottom, and pointed sharp, to prevent the poultry flying over, for they never attempt this, although it is so low. By keeping the feathers of one of the wings of such fowl clipped, they will be disabled from flying over the fence.

The enclosed space should be perfectly drained, (if the soil be not naturally dry) paved, and covered with fine gravel, and there should bo some contrivance by which clear water can be led into it. Part of the enclosed space should be under turf, to afford recreation to the fowls, which delight in searching for worms and insects.

A cottage farmer with from ten to twenty acres might make much gain by rearing and fattening turkeys (of the large and dark-coloured sort), provided he fences off a grass field for them, in which they may range about in search of insects, when there are no stubbles open to them. In Ireland, where small farms are common, turkeys used to be reared in great numbers by the farmers' wives, who, before poultry could be brought so quickly as now to England for sale, thought themselves sufficiently paid for their trouble and cost of rearing if they got from 3*s*. to 4*s*. a couple for them at Michaelmas. Since fat turkeys are now worth, in the great markets, from 6*s*. to 15*s*. each, and corn and other food are as cheap as at the period when turkeys of the same sort might have been bought for 4*s*. or 5*s*. each, it is pretty clear that a great profit may be made of them by the same class of little farmers now. A man who has a run of grass land, and the means of cultivating cabbages, turnips, field beet, etc., has the power of rearing and feeding turkeys, without much barley or oatmeal; and he cannot more profitably use whatever grain he may have, after giving a due share to his pigs, than by rearing and fattening these noble birds, which, when once reared, are extremely hardy.

Sun-flowers and lettuces, which may be sown in vacant spots, that might otherwise be profitless, are very useful and inexpensive for poultry. The seeds of the sun-flower are abundant, and are relished by fowls. Geese, ducks, and turkeys are very fond of lettuces, which if chopped up with bran or meal, assist much in their support.

CHAPTER XI.

ON THE CULTURE OF A COTTAGE FARM OF TEN ACRES.

A FARM of ten acres and a farm of two acres should be cultivated alike in respect of spade labour and alternations of white and green crops; but the farmer of ten acres may have occasion to alter his system of cropping, or at least the proportions of his market crops, according to the rise or fall in the value of such productions.

The prevailing culture in England is according to the Norfolk system, which is one of four courses, viz.: turnips, barley, clover, wheat, and the same again. The merit of the Norfolk system consists in these particulars; that two corn crops do not immediately follow each other; that the turnip crop, being eaten by sheep on the ground, and therefore manured and trodden by them, prepares light land, such as that of Norfolk generally, for barley, and that the roots of clover, in the next succession, bind the soil and render it firm for wheat. It has been found that clover does not succeed every fourth year on the same ground during a long course, therefore farmers have begun to sow it but once in eight years on the same ground, substituting vetches, Italian rye-grass, or some other artificial grass in its place occasionally. It is proved, also, that the same kinds of turnips do not succeed in the same soil every fourth year; changes, therefore, have been introduced into the Norfolk system, by which other green crops take a turn in the rotations.

The ten-acre farmer, who ought to keep milch cows and not sheep, will find field beet and carrots would answer him better than turnips, on suitable soil (unless he fattens cattle).* Such variations from the Norfolk system do not oppose its general rule or principle, viz.: that green crops of some kind should intervene between corn crops.

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* A much greater weight of turnips than of field beet is usually obtained from the same extent of land.

The true Norfolk course, though well-suited to barley soil, is not good for a strong clay soil, for which neither barley nor turnips (especially if eaten on the field) are fit crops. On such soil, wheat, oats, and beans ought to come as frequently as possible in the rotation: the course then becomes one of six or more years, and ceases to be the Norfolk one.

A cottage farmer might advantageously cultivate flax, if local circumstances were favourable. To render the culture of flax profitable, mills in the neighbourhood, for preparing the straw of the flax for market, and persons acquainted with the manner of taking off the seeds, by a process called *rippling*, and with the general management of the crop, would be necessary at the commencement of flax-cultivation in any place. In the north of Ireland, all the small farmers understand the treatment of flax from first to last, and they find it one of their most money-making crops.

When corn is very cheap, and pork and bacon are sufficiently dear for the farmer's interest, the cottage farmer might turn his barley and oats to more profit by fattening pigs with them, than by taking the corn to market.

A farmer, having cows which from age or any other circumstances require to be fattened off, would find it more profitable to give his barley, ground into meal, to such cows, than to sell the barley. Oat-meal is not so good for fattening cattle as barley-meal. Four pounds of barley-meal per day would be a sufficient allowance for a cow, with a moderate quantity of Swedish turnips or potatoes, and fourteen pounds of hay; with that quantity of meal, she will fatten much sooner than with a larger quantity of turnips and hay.

Good potatoes bring a very fair price: the cottage farmer who has potatoes to sell, finds them very profitable, if they escape disease, and produce as in old times. And if milk and butter, obtained by other green crops, bring a reasonably high price, the cottager has not cause of complaint as the large farmer has, who raises a vast deal more of wheat, according to the established system of farming than he consumes, and who depends upon the sale of that wheat, in a great degree, for paying the expenses of labour, and returning just interest on the large money capital which he expends in the management of his farm.

CHAPTER XII.

ON FLAX AND RAPE.

THE best soil for flax is a sandy loam, but any good wheat or barley soil, if not gravelly, is fit for flax. Very rich land would produce flax of too luxuriant and coarse a quality; for this reason, except on poor sandy soil, a crop of corn should be taken immediately before that of flax, and dung should never be applied to the flax crop itself. If a crop of wheat (manured) be taken before it, flax, with clover seeds may come next, instead of a barley crop, with decided profit, in those districts where it is still the bad custom to sow barley after wheat; because flax, at the present day, is more valuable than barley, and also because the preparation of the wheat stubble for flax would keep the land in clean order for clover.

Flax may be sown after turnips, potatoes, etc., on land not too rich from previous manuring; but it is more profitable to grow corn directly after these manured crops, and then flax. Experience has proved that flax is of better quality after corn than after any green crop. On rich loamy soil, good for beans and wheat, and also for flax, it might come in third in the order of successions, viz.: 1 beans (manured), 2 wheat, 3 flax. If flax should come in place of field beet or any other root crop, necessary for the winter keep of cattle, a sufficient quantity of green crops should be grown under every circumstance, in some suitable rotation; and yet a portion of a farm might be given up to a rotation in which flax could be introduced in place of established crops.

Flax should not be sown on newly broken-up ley; a crop of oats should be first sown on such land and then flax. Stubble land should be twice ploughed and harrowed, to clean it from weeds, in the course of the autumn and winter; in spring it should be again ploughed and harrowed, and rolled if any clods remain unbroken. The seed should then be sown broadcast and rather thickly, and covered by a small seed harrow. The only after-culture necessary is weeding until the flax is ripe for pulling. The weeding should be begun when the flax is about three inches high, and care should be taken to remove every weed so carefully, that the flax shall not be in any degree matted by this work; to prevent it, the weeder ought to press the stems one way. The flax will be ripe for pulling when about two-thirds of the stem become yellow, and lose the leaves in pulling. The long and short stems should be drawn separately, so that they may be of equal lengths for the operations of rippling, and of steeping.

The seed which used to be lost in steeping, is now generally saved, and warm water, instead of the cold water of ponds, is used for steeping the straw, by which means the quality, and therefore the value, of flax is improved. The process of drying it also, is rendered more simple, by means of machinery.

Flax seed, or linseed, as it is also called, is in great demand for fattening cattle, as is proved by the fact that *two millions of pounds sterling* have been paid yearly by our farmers, to foreign countries, for the seed, for the purposes of sowing and feeding cattle.

Holland, Belgium, and the north of Ireland, are the countries in which flax is best cultivated and managed. In the case of the Belgian treatment of the flax, it is to be observed that the manure is in a liquid form, and applied to a sandy soil. In the warm summer climate of Belgium, the effects of the liquid manure pass quickly away, and the natural porousness of the soil prevents it, even when manured, from producing the rank and coarse-fibred flax which such manuring would probably cause in our moister climate and richer soil. The Belgian farmers depend upon flax and rape mostly for producing money; the other crops they principally consume by their families, and the cattle which produce the large quantities of manure, that enable them to raise so many exhausting crops as wheat, flax, and rape, in a single rotation.

The cottage farmer will find flax more profitable than rape on a soil fit for it; but on a cold, clay soil (which is unfit for flax), rape may be grown with great advantage: it produces a greater weight of seed to the acre than wheat does of corn, and it now brings a higher price in our markets, by the quarter, than wheat.

The most economical way of raising a crop of rape for seed is to sow the seeds in a bed early in July, and dibble the plants in rows, fifteen inches apart every way, in the latter end of autumn, after the stubble land has been well-dug and manured. The rape plants should be kept quite free from weeds by hoeing and moulding, as long as the hoe can be introduced. The seed pods of the plants will fill and ripen in June and July, but care should be taken to cut the crop before the pods are fully ripe, else much of the seed will be shed upon the ground.

CHAPTER XIII.

ON THE CULTURE OF A COTTAGE FARM OF TWENTY ACRES.

THE system of culture suitable for ten acres is equally so for twenty acres, as to the proportions and rotations of the crops; but the culture of twenty acres will require the labour of a horse. The plough, the harrow, and the cart will, for the most part, be used instead of the spade, the rake, and the wheel-barrow; and the horse-drill and the horse-hoe will, in most cases, supersede the dibble and the hand-hoe. The tillage of twenty acres should not require the constant labour of a horse, as two horses are sufficient for fifty acres, under a regular system of husbandry; one horse, according to this proportion, would be one-fifth of his time, or about sixty-two days (not reckoning Sundays) idle; unless, therefore, the horse could earn something for its owner, by extra work off the farm, it would not be fully employed. If two cottage farmers, having twenty or twenty-five acres and one horse each, agree to yoke their horses together for ploughing (and harrowing) they can thus assist each other, and get over the ploughing. But some differences may occur in this arrangement; for instance, the horses may be ill-matched in step and strength. In shallow and very sandy soil, a strong, well-fed horse could, though slowly, plough without assistance; and if a man were to follow in the furrow and loosen the soil and subsoil below with a digging-fork, the want of another horse would not be experienced; but in clay soil it would be impossible for a single horse to do the work.

A cow is often yoked with a horse to plough and harrow, by the Belgian and German peasantry, and sometimes two cows are yoked together; and oxen, in all countries, are commonly used for ploughing, either together only, or with horses, but the step of a cow or ox and that of a horse, and their strength of draught may be so unequal, as to make them bad yoke-fellows. We do not see why a cottage farmer with twenty acres may not use two cows for ploughing, instead of a horse, or why he may not employ two oxen and fatten them for the butcher, after the season's work has been completed.

By keeping a horse, the cottage farmer will be saved a great deal of manual labour; he will be able to drill all his crops with a plough, and hoe and mould them rapidly, with the aid of his horse, and therefore there will be more time left to attend to other matters. No one could possibly cultivate twenty acres with the spade. Besides, horse-manure is much more beneficial on a farm (but especially on a clay soil) than any other kind of farm-yard manure.

Before purchasing a horse, the cottage farmer should calculate beforehand whether it will not be cheaper for him to hire men to assist him in digging his land, as often as it may require it, and in putting out manure with a wheelbarrow, than to sink money in the purchase of a horse, plough, cart, and tackling, and expend in the keeping of that horse, and in the value of the labour of the person who attends it, what must at least amount to £35 a year. There is also to be considered the wear and tear of the horse, and its liability to infirmity or death by disease or accident; therefore, circumstances must decide for or against the economy of horse-keeping.

The horse should be always kept in stable, for if pastured, its manure will be profitless, and ground will be wasted (as in the case of cows pastured) as shown in the chapter on cow-keeping. A farm-horse should have about 14 lbs. of hay, 7 lbs. of straw cut into chaff and mixed with 7 lbs. of oats and 3 lbs. of beans per day; and for a change, steamed or boiled potatoes or Swedish turnips may be given three or four times a week at night, or more frequently if these roots be plentiful and hay scarce. In this case, hay may be dispensed with altogether, and good straw or the haulm of beans, chopped and boiled, given instead. Bruised furze makes an excellent substitute for either hay or straw, but with this a more liberal allowance of oats will be necessary; neither potatoes nor turnips should be given with furze, which is of a relaxing nature. The food of a working-horse should not be either too binding or too relaxing, and therefore, there should be due proportions of oats, hay, or straw with the other sorts of food mentioned. If the farmer cultivates barley (which, in our climate, is not considered good for horses) and not oats in his rotations, he need not buy oats for his horse, if he gives clover, hay, carrots, and other roots in sufficient quantities. We have stated that a well-fed horse ought to have oats to keep him in very good working order, but in point of fact, he is rarely thus well-fed by small farmers; but the consequence is, that the value of their horses is lowered accordingly.

The hours of feeding a horse should be regular, and frequent, whatever be the food. "Of all animals, he has the smallest stomach relative to his size." Unlike the cow, the horse cannot bring up his food from the stomach to chew: he has no room in it for spare food, and after moderate work, returns eagerly to his manger, which shows that he has a rapid digestion, and that his stomach requires to be frequently filled. Oat straw is somewhat more nourishing than that of barley, and barley a degree more so than wheat straw. Fresh threshed oat straw is much relished by horses, and if not too closely threshed, quite a luxury, and much more nourishing than bad hay for them. The horse which gts a mess of any warm or nutritious food after its day's work, with a small quantity of hay or straw, so cut that it can be eaten in a short time, has the advantage of having its stomach filled quickly, instead of being obliged to pull straws out of a rack for many hours before its hunger is satisfied and it can take rest.

Bean straw ranks in point of nourishment with wheaten straw, but the haulm of peas is considerably more nourishing than that of beans, and even more so than oaten straw. Whatever be its food, the horse should not be stinted. A farmer ought to have pride in keeping his horse in a fat and sleek condition. Horses ill-fed, even though they be not over-worked, do not last so long, and are more subject to diseases, than horses that are sufficiently fed; therefore, for economy sake, they ought to be well-fed.

Soft food, such as potatoes, turnips, etc., is especially necessary for old horses, whose teeth can neither chew corn or straw and coarse hay without great difficulty. To an old horse, whose teeth have lost their full powers, a feed of bran is more useful and satisfying than one of corn, most of which passes through its stomach undigested. The mixing of chaff with corn causes a horse to chew every grain of the corn, and since many horses swallow corn voraciously, without half chewing it, the mixing of chaff with corn is a good and saving practice.

CHAPTER XIV.

FARM OFFICES.

Farms of ten or twenty acres, cultivated on the foregoing system, will require cow sheds, of length suited to the number of cows and calves to be kept, fitted with feeding boxes, posts, and iron chains, for confining the cattle by the head, at proper distances from each other; a dairy room, a little barn, a tool house, root house; and pig-sties, with paved yards, divided from each other, for store and fat pigs, and for brood sows and their young ones, when weaned, will be absolutely necessary. One of the greatest wants which a farmer who keeps all his live stock house-fed can experience, is that of sufficient room for them, accordingly as they increase; therefore, he should not be too much limited in the beginning, as to extent of offices. A farm of twenty acres will require no more offices than have been already mentioned, except a stable for one or two horses, and a shed large enough to hold a cart, plough, harrow, and horse hoe.

The materials of which the offices of a small farm should be built, must depend on the circumstances in which the occupier of the farm stands, whether he is the owner of the farm, or only the tenant, and in the former case, as to his means of providing durable materials, or otherwise. Few landlords would find it their interest to erect buildings of any description on a farm of ten or even twenty acres, because the same buildings would nearly suit a farm of fifty or more acres. But, supposing there is no difficulty in providing materials for the farm offices, the best materials are—stone, or brick and mortar, for walls, and slates or pan-tiles for roofs, and in the long run the most economical—because the most durable materials for farm offices. But if any circumstances induce the holder of the cottage farm or his landlord to use cheaper materials, he may substitute for bricks, stones, tiles, and slates, walls of well-tempered clay, regularly and neatly raised, which will, if protected from rain by a roof with a wide eave, last a considerable time. Thatch is so perishable, and so liable to fire, that it is not to be recommended in any case, in place of slates or tiles. Walls made with wooden frames and clay mortar are, in some localities, very convenient and inexpensive. Much depends on the quality of the clay that may be obtained for walls, and on the presence or absence of building stones from the land on which the buildings are to be erected; and also upon the scarcity or abundance of timber in the neighbourhood. Farm timber answers economically and well for the walls and partitions of farm offices, if the outer sides be thickly coated with coal tar or pitch. Covered gutters should lead from the flooring of the cattle sheds to the place which receives the liquid manure.

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